(19) World Intellectual Property Organization International Bureau



(43) International Publication Date 20 December 2001 (20.12.2001)

(51) International Patent Classification7:

PCT

(10) International Publication Number WO 01/96419 A3

210/02, B65D 53/06

(21) International Application Number: PCT/GB01/02650

(22) International Filing Date: 14 June 2001 (14.06.2001)

(25) Filing Language:

English

C08F 10/02,

(26) Publication Language:

English

(30) Priority Data: 0014547.4

14 June 2000 (14.06.2000) GB

- (71) Applicant (for all designated States except US): BORE-ALIS TECHNOLOGY OY [FI/FI]; P.O. Box 330, FIN-06101 Porvoo (FI).
- (71) Applicant (for GB only): GOLDING, Louise [GB/GB]; c/o 179 Queen Victoria Street, London EC4V 4EL (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): BAANN, Hege, Vale [NO/NO]; Planetveien 34, N-3942 Skjelsvik (NO). LIN-DAHL, Ann, Kristin [NO/NO]; Skiensgate 32, N-3912 Porsgrunn (NO).
- (74) Agents: GOLDING, Louise et al.; Frank B. Dehn & Co., 179 Queen Victoria Street, London EC4V 4EL (GB).

- (81) Designated States (national): AE, AG, AL, AM, AT, AT (utility model), AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, CZ (utility model), DE, DE (utility model), DK, DK (utility model), DM, DZ, EC, EE, EE (utility model), ES, FI, FI (utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 25 April 2002

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

` } -

(54) Title: INJECTION MOULDING POLYMER

(57) Abstract: The invention relates to the use of an LLDPE produced using a single site catalyst, e.g. an LLDPE produced using a metallocene (m-LLDPE), in injection moulding of food packaging material, especially closures for food containers. Such materials have been found to exhibit low levels of migration, typically less than 40 mg/dm², e.g. less than 5 mg/dm², and are particularly suitable for use in packaging foods having a high fat content.

IN INATIONAL SEARCH REPORT

Inter.onal Application No PCT/GB 01/02650

			017 02000
A. CLASSI IPC 7	FICATION OF SUBJECT MATTER C08F10/02 C08F210/02 B65D53/00	5	
According to	International Patent Classification (IPC) or to both national classificat	ion and IPC	
B. FIELDS	SEARCHED		
Minimum do IPC 7	cumentation searched (classification system followed by classification COSF B65D	n symbols)	
	ion searched other than minimum documentation to the extent that su		
	ata base consulted during the international search (name of data base	s and, where practical, search terms u	seu)
C. DOCUME	ENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the rele-	vant passages	Relevant to claim No.
А	US 4 424 243 A (NISHIMOTO YOSHIHAI AL) 3 January 1984 (1984-01-03) column 2, line 39 -column 2, line examples 1,7		
X	US 5 929 128 A (GREENE EDWARD E 1 27 July 1999 (1999-07-27) the whole document	ET AL)	1-11, 19-24
А	US 5 026 798 A (CANICH JO ANN MAR 25 June 1991 (1991-06-25) the whole document	(E)	2,7
		/ 	
	•		
			,
X Furth	her documents are tisted in the continuation of box C.	Patent family members are lis	ted in annex.
° Special ca	tegories of cited documents:	T* later document published after the	international filing date
	int defining the general state of the art which is not ered to be of particular relevance	or priority date and not in conflict v cited to understand the principle o	with the application but
'E' eartier o	ocument but published on or after the international	invention X* document of particular relevance; the	
filing d	nt which may throw doubts on priority claim(s) or	cannot be considered novel or car involve an inventive step when the	document is taken alone
citation	or other special reason (as specified)	Y" document of particular relevance; the cannot be considered to involve an example of the cannot be considered to involve an example.	n inventive step when the
other r	···-	 document is combined with one or ments, such combination being ob in the art. 	
	ent published prior to the international filing date but an the priority date claimed	8' document member of the same pat	ent family
Date of the	actual completion of the international search	Date of mailing of the international	search report
	February 2002		
Name and n	nailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2	Authorized officer	
	NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,	Van Golde, L	

6

IN INATIONAL SEARCH REPORT

Inte,: auonal Application No
PCT/GB 01/02650

	TO SHAFFING CONCINEDED TO BE DELEVANT	101/48 01/02030
Category *	ation) DOCUMENTS CONSIDERED TO BE RELEVANT Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 11, 30 September 1998 (1998-09-30) & JP 10 147370 A (TOPPAN PRINTING CO LTD), 2 June 1998 (1998-06-02) abstract	1
X	WO 98 46409 A (JACOBS IAN ORDE MICHAEL) 22 October 1998 (1998-10-22) page 3, line 4 -page 3, line 17	6-9
X	US 5 925 430 A (MIERZWIAK JAMES G ET AL) 20 July 1999 (1999-07-20) the whole document	19-24
		·

6

INTERNATIONAL SEARCH REPORT

International application No. PCT/GB 01/02650

Box I Observations wh re certain claims wer found unsearchable (Continuation of item 1 of first sheet)
This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:
1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
Claims Nos.: because they relate to parts of the International Application that do not compty with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).
Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)
This International Searching Authority found multiple inventions in this international application, as follows:
see additional sheet
As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.: 1-11, 19-24
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
Remark on Protest The additional search fees were accompanied by the applicant's protest. X No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-11

Use of an LLDPE prepared using a single site catalyst in injection moulding of food packaging material.

2. Claims: 12-18

LLDPE suitable for use in injection moulding having a migration level of 40 mg/square dm.

3. Claims: 19-24

A closure for a food container formed from an LLDPE.

IN :NATIONAL SEARCH REPORT

Information on patent family members

Inter....onal Application No
PCT/GB 01/02650

	unoma	tion on patent tariny me	ill Del 3	PCT/GB	01/02650
Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 4424243	Α	03-01-1984	JP JP JP	1576889 C 57039957 A 61000184 B	24-08-1990 05-03-1982 07-01-1986
			JP	1507652 C	26-07-1989
			ĴΡ	56089945 A	21-07-1981
			ĴΡ	61001295 B	16-01-1986
			ΑU	533613 B2	01-12-1983
			ΑU	6559980 A	16-07-1981
			DE	3064167 D1	18-08-1983
			DK	539480 A ,B,	26-06-1981
			EP	0032027 A2	15-07-1981
US 5929128	Α	27-07-1999	US	5849418 A	15-12-1998
			US AU	5723507 A 3970397 A	03-03-1998 25-02-1998
			WO	9805731 A1	12-02-1998
			ÜS	6235822 B1	22-05-2001
			AT	204890 T	15-09-2001
			ΑU	711738 B2	21-10-1999
			ΑU	1969097 A	01-10-1997
			BR	9708001 A	27-07-1999
			CA	2245735 A1 1213390 A ,B	18-09-1997
			CN DE	69706409 D1	07-04-1999 04-10-2001
			EP	0891390 A1	20-01-1999
			ES.	2159845 T3	16-10-2001
			JP	2000506820 T	06-06-2000
			NO	984155 A	10-09-1998
			TR	9801808 T2	21-12-1998
			WO	9733935 A1	18-09-1997
			AT CA	164876 T 2169177 A1	15-04-1998 23-02-1995
1			DE	69409530 D1	14-05-1998
			DE	69409530 T2	06-08-1998
			ΕP	0714426 A1	05-06-1996
			ES	2114221 T3	16-05-1998
			FI	960719 A	15-04-1996
			JP	9501720 T	18-02-1997
			WO AT	9505426 A1 181351 T	23-02-1995 15-07-1999
•			CA	2169067 A1	23-02-1995
			DE	69419160 D1	22-07-1999
			DE	69419160 T2	14-10-1999
			DE	714427 T1	28-11-1996
			EP	0714427 A1	05-06-1996
			ES	2089990 T1	16-10-1996
			FI GR	960720 A 96300043 T1	16-02-1996 31-08-1996
			GR	3030440 T3	31-08-1996
			JP	9501721 T	18-02-1997
			WO	9505427 A1	23-02-1995
US 5026798	Α	25-06-1991	AT	209662 T	15-12-2001
			AU	667292 B2	21-03-1996
			AU	8754291 A	15-04-1992 20-07-1993
			BR CA	9106842 A 2090872 A1	20-07-1993 14-03-1992
			DE	69132836 D1	10-01-2002
For DCT#SAMA (aster) (aster) (

IN :NATIONAL SEARCH REPORT

Information on patent family members

Inter. ...unal Application No PCT/GB 01/02650

Patent document cited in search report	Publication date		Patent family member(s)	Publication date
US 5026798 A	<u> </u>	EP	0548277 A1	30-06-1993
		JP	6505033 T	09-06-1994
		WO	9205204 A1	02-04-1992
		US	5420217 A	30-05-1995
		US	5504169 A	02-04-1996
		US	5723560 A	03-03-1998
		AT	141275 T	15-08-1996
		ΑT	151429 T	15-04-1997
		ΑU	6248390 A	21-03-1991
		AU	643237 B2	2 11-11-1993
		AU	6443990 A	18-04-1991
		BR	9004537 A	10-09-1991
		BR	9007642 A	21-07-1992
		CA	2024899 A1	14-03-1991
		CA	2065745 A1	14-03-1991
		DD	343767 B1	07-05-1992
		DE	69028057 DI	
		DE	69028057 T3	
		DE	69030442 DI	15-05-1997
		DE	420436 T1	15-02-1996
		DE	662484 TI	27-06-1996
		DK	420436 T3	3 02-12-1996
		DK	491842 T3	3 27-10-1997
		EΡ	0420436 A1	03-04-1991
		EP	0491842 A	l 01-07-1992
		EΡ	0662484 A2	
		EP	0671404 A2	
		ΕP	0643066 A2	2 15-03-1995
		ES	2091801 T	3 16-11-1996
		ES	2079332 T	l 16-01-1996
		GR	3021539 T	3 28-02-1997
		GR	3034632 T	31-01-2001
		HU	55791 A	2 28-06-1991
		ΙL	119415 A	01-06-2000
		JP	3188092 A	16-08-1991
		JP	2994746 B	2 27-12-1999
		KR	190735 B	
		KR	195662 B	1 15-06-1999
		NO	178891 B	18-03-1996
JP 10147370 A	02-06-1998	NONE		
WO 9846409 A	22-10-1998	AU	6814498 A	11-11-1998
		WO	9846409 A	
		EP	0981431 A	
		HU	0102647 A	
		TW	397757 B	11-07-2000
		ZA	9803104 A	30-10-1998
US 5925430 A	20-07-1999	NONE		